IN THE SPECIFICATION:

Please amend paragraph number **[0001]** as follows:

[0001] This application is a divisional of application Serial No. 09/777,629, filed February 6, 2001, now United States Patent 6,648,832, issued November 18, 2003, which is a continuation of application Serial No. 09/262,510, filed March 2, 1999, now United States Patent 6,227,196, issued May 8, 2001, which is a continuation-in-part of application Serial No. 08/770,138, filed December 19, 1996, now United States Patent 6,306,098, issued October 23, 2001.

Please amend paragraph number **[0021]** as follows:

[0021] The apparatus and methods of the present invention apply a modified Fick Equation to calculate changes in partial pressure of carbon dioxide (P_{CO_2}), flow, and concentration to evaluate the cardiac output or pulmonary capillary blood flow of a patient. The traditional Fick Equation, written for CO_2 is:

$$Q = \frac{V_{CO_2}}{\left(C_{v_{CO_2}} - C_{a_{CO_2}}\right)},$$

where Q is pulmonary capillary blood flow ("PCBF"), V_{CO_2} is the output of CO_2 from the lungs, or "CO_2 elimination," and Ca_{CO_2} and Cv_{CO_2} are the CO_2 contents of the arterial blood and venous blood CO_2, respectively. It has been shown in the prior work of others that cardiac output can be estimated from calculating the change in the fraction or volume of CO_2 exhaled by a patient and the partial pressure of end-tidal CO_2 as a result of a sudden change in ventilation. That can be done by applying a differential form of the Fick Equation, as follows:

$$Q = \frac{V_{CO_{2_1}}}{\left(C_{v_1} - C_{a_1}\right)} = \frac{V_{CO_{2_2}}}{\left(C_{v_2} - C_{a_2}\right)},$$

where Ca is the CO_2 content of the arterial blood of a patient, Cv is the CO_2 content of the venous blood of the patient, and the subscripts 1 and 2 refer to measured values before a change in ventilation and measured values during a change in ventilation, respectively. The differential form of the Fick Equation can, therefore, be rewritten as:

$$Q = \frac{V_{CO_{2_1}} - V_{CO_{2_2}}}{\left(C_{v_1} - C_{a_1}\right) - \left(C_{v_2} - C_{a_2}\right)}$$

or

$$Q = \frac{\Delta V_{CO_2}}{\Delta C_{a_{CO_2}}} = \frac{\Delta V_{CO_2}}{s \Delta PetCO_2},$$

where ~~ĆVCO~~$_{\cancel{2}}$- <u>ΔVCO_2</u> is the change in CO_2 elimination in response to the change in ventilation, ~~ĆCa~~$_{\cancel{CO_2}}$- <u>ΔCa_{CO_2}</u> is the change in the CO_2 content of the arterial blood of the patient in response to the change in ventilation, ~~ĆPet~~$_{\cancel{CO_2}}$- <u>Δ Pet_{CO_2}</u> is the change in the partial pressure of end-tidal CO_2, and *s* is the slope of a CO_2 dissociation curve known in the art. The foregoing differential equation assumes that there is no appreciable change in venous CO_2 concentration during the re-breathing episode, as demonstrated by Capek. Also, a CO_2 dissociation curve, well known in the art, is used for determining CO_2 concentration based on partial pressure measurements.

Please amend paragraph number **[0060]** as follows:

[0060] With reference to FIG. 8B, where a patient is anesthetized or is otherwise exhaling gas which is undesirable for venting to the atmosphere, a chamber or receptacle 112, such as an expandable bag, may be disposed along the evacuation line 106 or otherwise in flow communication with the evacuation valve 108 to receive the exhaled gas leaked from the ventilation ~~circuit.~~ apparatus.

Please amend paragraph number **[0073]** as follows:

[0073] The partial pressure of CO_2 in the parallel ~~dead space~~ deadspace ($CO_{2\ PDS}$) may be calculated from the mixed inspired CO_2 (Vi_{CO_2}) added to the product of the serial deadspace multiplied by the end tidal CO_2 of the previous breath ($Pet_{CO_2}(n-1)$). Because the average partial pressure of CO_2 in the parallel deadspace is equal to the partial pressure of CO_2 in the parallel deadspace divided by the tidal volume (V_t) (i.e., the total volume of one respiratory cycle, or breath), the partial pressure of CO_2 in the parallel deadspace may be calculated on a breath-by-breath basis, as follows:

$$P_{CO_2\ PDS}(n)=[FRC/(FRC+V_t)] \cdot P_{CO_2\ PDS}(n-1) + (P_{bar} \cdot (([Vi_{CO_2} + \text{deadspace} \cdot (Pet_{CO_2}(n-1)/P_{bar})]/V_t) \cdot [V_t/(V_t+FRC)])),$$

where (n) indicates a respiratory profile parameter (in this case, the partial pressure of CO_2 in the parallel deadspace, $P_{CO_2\ PDS}(n)$) from the most recent breath and (n-1) indicates a respiratory profile parameter from the previous breath.

Please amend paragraph number **[0074]** as follows:

[0074] The partial pressure of end-tidal CO_2, which is assumed to be substantially equal to a weighted average of the partial pressure of CO_2 in all of the perfused and unperfused alveoli of a patient, may be calculated as follows:

$$Pet_{CO_2} = \cancel{(r)PA_{CO_2})}\ \underline{((r)PA_{CO_2})} + (1 - r)P_{CO_2\ PDS},$$

where r is the perfusion ratio, which is calculated as the ratio of perfused alveolar ventilation to the total alveolar ventilation, or $(V_A - V_{PDS})/V_A$. The perfusion ratio may be assumed to be about 0.95 or estimated, as known in the art. Alternatively, the perfusion ratio may be determined by comparing arterial P_{CO_2}, which measurement may be obtained directly from arterial blood and assumed to be substantially the same as alveolar P_{CO_2}, to end tidal P_{CO_2} values by rearranging the previous equation as follows:

$$r = (Pet_{CO_2} - P_{CO_2\ PDS})/(PA_{CO_2} - P_{CO_2\ PDS}).$$